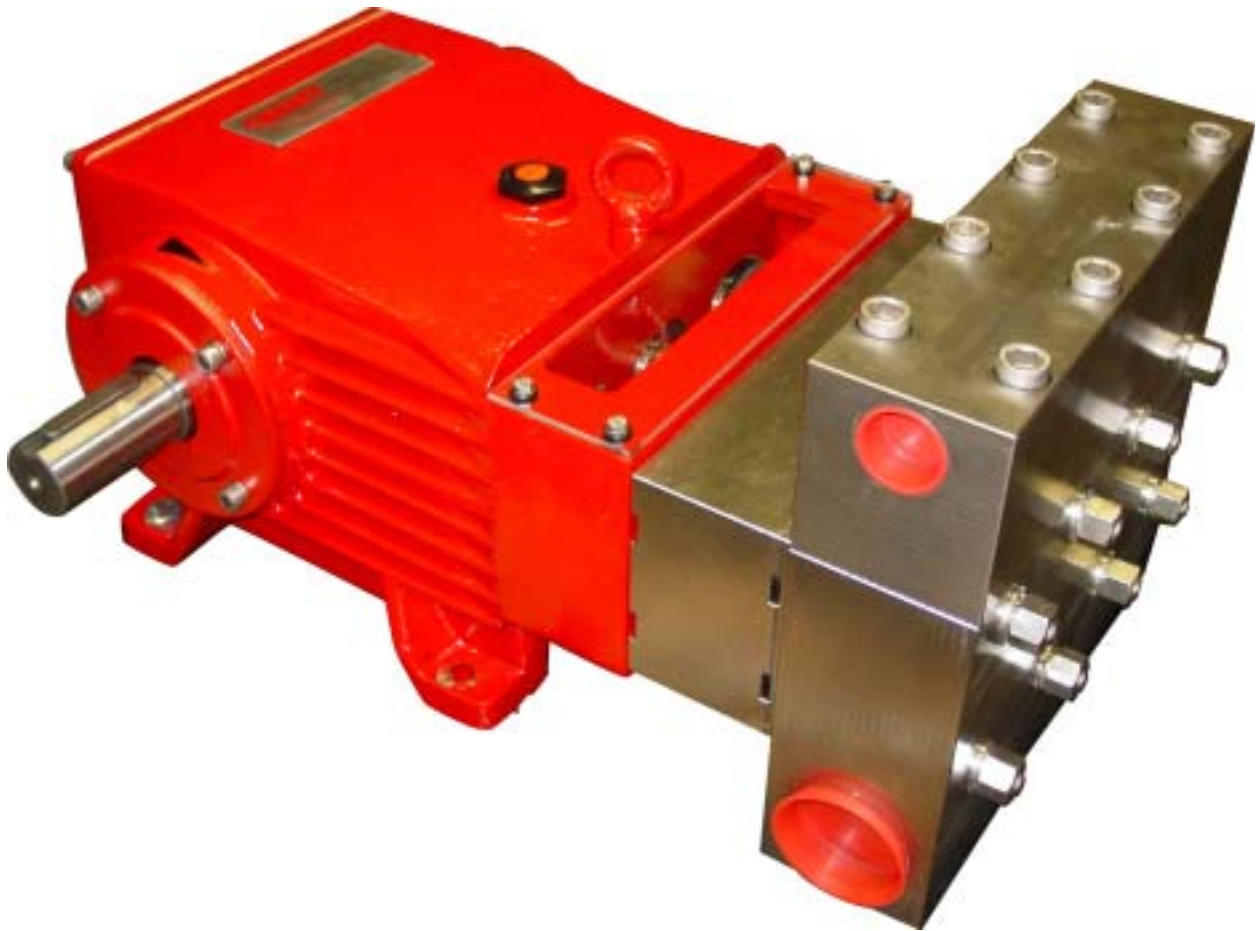


Model GP7170-4000

Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service
Manual



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INSTALLATION INSTRUCTIONS

Installation of the Giant Industries, Inc., pump is not a complicated procedure, but there are some basic steps common to all pumps. The following information is to be considered as a general outline for installation. If you have unique requirements, please contact Giant Industries, Inc. or your local distributor for assistance.

1. The pump should be installed flat on a base to a maximum of a 15 degree angle of inclination to ensure optimum lubrication.
2. The inlet to the pump should be sized for the flow rate of the pump with no unnecessary restrictions that can cause cavitation. Teflon tape should be used to seal all joints. If pumps are to be operated at temperatures in excess of 140 °F, it is important to insure a positive head to the pump to prevent cavitation.
3. The discharge plumbing from the pump should be properly sized to the flow rate to prevent line pressure loss to the work area. It is essential to provide a safety bypass valve between the pump and the work area to protect the pump from pressure spikes in the event of a blockage or the use of a shut-off gun.
4. Use of a dampener is necessary to minimize pulsation at drive elements, plumbing, connections, and other system areas. The use of a dampener with Giant Industries, Inc. pumps is optional, although

recommended by Giant Industries, Inc. to further reduce system pulsation. Dampeners can also reduce the severity of pressure spikes that occur in systems using a shut-off gun. A dampener must be positioned downstream from the un-loader.

5. Crankshaft rotation on Giant Industries, Inc. pumps should be made in the direction designated by the arrows on the pump crankcase. Reverse rotation may be safely achieved by following a few guidelines available upon request from Giant Industries, Inc. Required horsepower for system operation can be obtained from the chart on page 3.
6. Before beginning operation of your pumping system, remember: Check that the crankcase and seal areas have been properly lubricated per recommended schedules. Do not run the pump dry for extended periods of time. Cavitation will result in severe damage. Always remember to check that all plumbing valves are open and that pumped media can flow freely to the inlet of the pump.

Finally, remember that high pressure operation in a pump system has many advantages. But, if it is used carelessly and without regard to its potential hazard, it can cause serious injury.

IMPORTANT OPERATING CONDITIONS

Failure to comply with any of these conditions invalidates the warranty

1. Prior to initial operation, add oil to crankcase so that the oil level is between the two lines on the oil dipstick. **DO NOT OVERFILL. Use Giant recommended oil.** Crankcase oil should be changed after the first 50 hours of operation, then at regular intervals of 500 hours or less depending on operating conditions.

2. Pump operation must not exceed rated pressure, volume, or RPM. A pressure relief device must be installed in the discharge of the system.
3. Acids, alkalines, or abrasive fluids cannot be pumped unless approval in writing is obtained before operation from Giant Industries, Inc.
4. Run the pump dry approximately 10 seconds to drain the water before exposure to freezing temperatures.

* **Important** - Check torque bi-weekly on item 49A

Specifications

Model GP7170-4000

	U.S.	Metric
Volume	84.5 GPM	320 LPM
Discharge Pressure	1450 PSI	100 bar
Speed		Up to 700 RPM
Inlet Pressure		Up to 90 PSI ² (10 bar)
Plunger Diameter	2.48"	63 mm
Plunger Stroke	2.05"	52mm
Crankshaft Diameter	2.05"	52mm
Key Width		14mm
Crankshaft Mounting		Either side
Shaft Rotation		Top of pulley towards manifold
Temperature of Pumped Fluids	140 °F	60°C
Inlet Ports		(2) 1 1/4" NPT
Discharge Ports		(2) 3/4" NPT
Weight	374 lbs.	170 kg
Crankcase Oil Capacity	1.6 Gal.	6.0 liters
Fluid End Material		Stainless Steel

Consult the factory for special requirements that must be met if the pump is to operate beyond one or more of the limits specified above.

GP7170 PULLEY SELECTION & HORSEPOWER REQUIREMENTS							
PUMP PULLEY	MOTOR PULLEY	RPM	GPM	500 PSI	750 PSI	1000 PSI	1500 PSI
12.75	7.00	300	36.0	12.9	19.3	25.7	38.6
12.75	9.20	400	49.0	17.5	26.3	35.0	52.5
12.75	11.45	500	60.0	21.4	32.1	42.9	64.3
12.75	12.75	700	84.5	30.2	45.3	60.4	90.5

HORSEPOWER RATINGS:

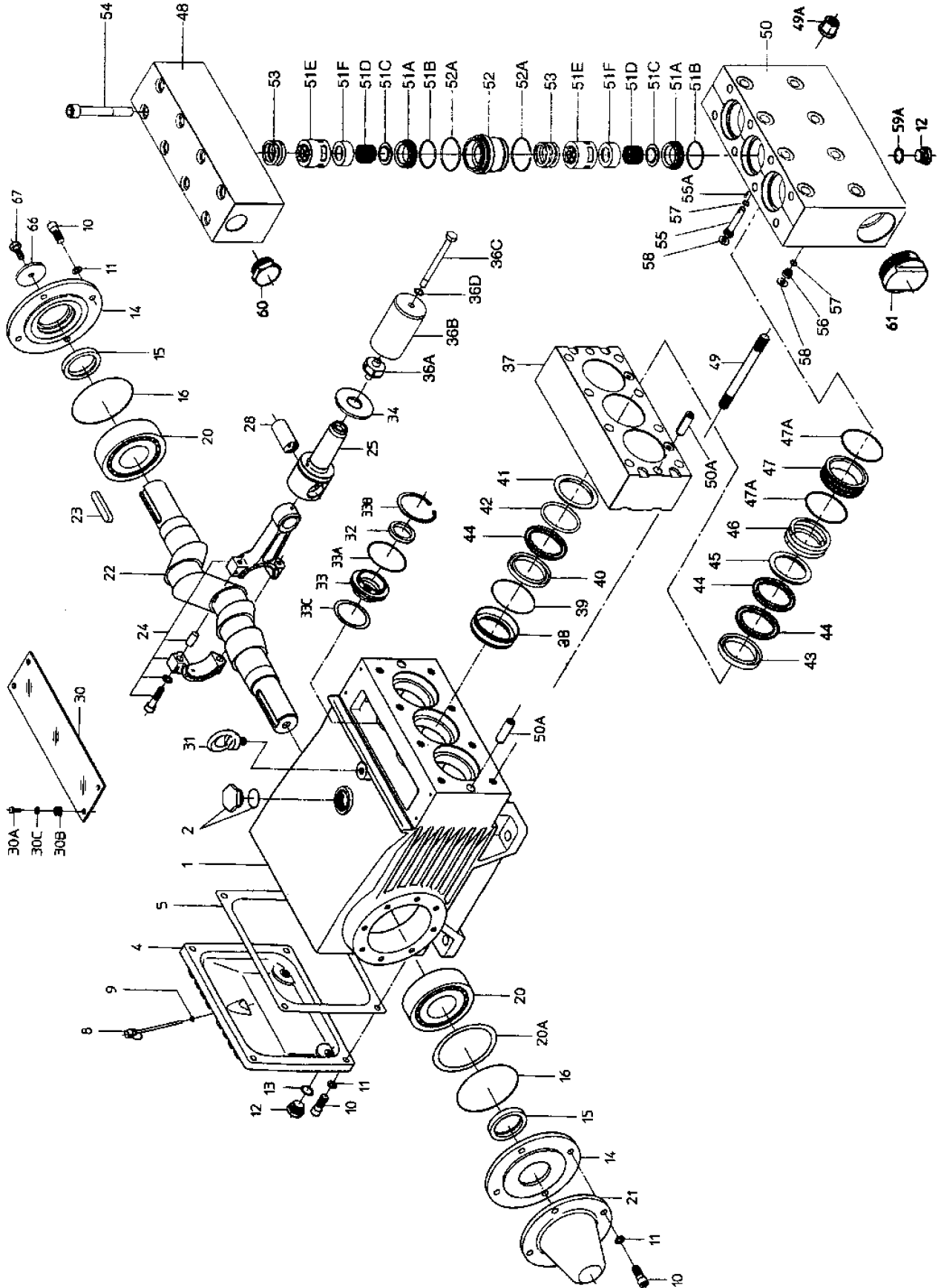
The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend a 1.1 service factor be specified when selecting an electric motor as the power source.

To compute specific pump horsepower requirements, use the following formula:

$$\frac{\text{GPM} \times \text{PSI}}{1400} = \text{hp}$$

Exploded View - GP7170-4000



GP7170-4000 PARTS LIST

<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	06653	Crankcase	1	38	05234	Seal Sleeve	3
2	13000	Oil Filler Plug Assembly	1	39	05235	O-Ring for Seal Retainer	3
4	07601	Crankcase Cover	1	40	05236	Pressure Ring	3
5	07602	Seal for Crankcase Cover	1	41	05237	Drip Return Ring	3
8	07603	Oil Dip Stick	1	42	05238	O-Ring	3
9	01009	O-Ring, Dip Stick	1	43	05239	Pressure Ring	3
10	22706	Hexagon Screw	12	44	05240	Sleeve	9
11	06725	Spring Washer	12	45	05241	Sleeve Support Ring	3
12	07109-0400	Drain Plug	5	46	05071	Seal Tension Spring	3
13	07182	Gasket, Drain Plug	2	47	05242	Seal Case	3
14	07607	Bearing Cover	2	47A	06667	O-Ring	6
15	07608	Radial Shaft Seal	2	48	05243	Discharge Casing	1
16	07184	O-Ring for Bearing Cover	2	49	06675	Stud Bolt	8
20	07610	Taper Roller Bearing	2	49A	06958	Hexagon Nut	8
20A	07611	Fitting Disc (Shim)	1-5	50	05244	Valve Casing	1
21	07612	Shaft Protector	1	50A	13162	Cylinder Stud	4
22	13405	Crankshaft	1	51	05245	Valve Assembly	6
23	07614	Key	1	51A	05246	Valve Seat	6
24	13182	Connecting Rod Assy.	3	51B	07653	O-Ring for Valve Seat	6
25	13183	Crosshead Assy.	3	51C	05247	Valve Plate	6
28	13184	Crosshead Pin	3	51D	07732-0100	Valve Spring	6
30	06661	Cover Plate	1	51E	08281	Spacer Pipe	6
30A	07225-0100	Hexagon Screw	4	51F	05248	Valve Spring Guide	6
30B	13136	Grommet	4	52	05249	Pressure Valve Adapter	3
30C	08280	Disc	4	52A	07658	O-Ring	6
31	07623	Eye Bolt	1	53	13173	Tension Spring	6
32	07624	Radial Shaft Seal	3	54	05250	Inner Hexagon Screw	8
33	06662	Seal Retainer	3	55	05251	Drip Return Connection	1
33A	13286	O-Ring for Seal Retainer	3	55A	22764	Serrated Pin	1
33B	05229	Circlip for Seal Retainer	3	56	05252	Drip Return Plug	1
33C	05230	Fitting Disc	3	57	05253	O-Ring	2
34	13137	Oil Scraper (Flinger)	3	58	05254	Leakage Seal	2
36	05231	Plunger Pipe Assembly (36A-36D)	3	59A	06807	Steel Ring (Gasket)	1
36A	07667	Plunger Base	3	60	13151	Plug 1-1/4" BSP	1
36B	05232	Plunger Pipe	3	61	12252-5000	Plug 2-1/2" BSP	1
36C	07664	Tensioning Screw	3	66	13362	Disc for Crankshaft	1
36D	07665	Copper Ring	3	67	13358	Hexagon Screw	1
37	05233	Intermediate Casing	1		07662	Slide Hammer Tool (not shown)	1

GP7170-4000 REPAIR KITS

Plunger Packing Kit # 09610

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
39	05235	O-Ring for Seal Retainer	3
42	05238	O-Ring	3
44	05240	V-Sleeve	9
47A	05242	O-Ring	6

Oil Seal Kit # 09612

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
32	07624	Radial Shaft Seal	3
33A	07627	O-Ring	3

Inlet Valve Assembly Kit # 09611

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
51A	05246	Valve Seat	1
51B	07653	O-Ring for Valve Seat	1
51C	05247	Inlet Valve Seat	1
51D	07732-0100	Valve Spring	1
51F	05248	Valve Spring Guide	1
52A	07658	O-Ring	2

GP7170-4000 REPAIR INSTRUCTIONS

NOTE: Always take time to lubricate all metal and non-metal parts with a light film of oil before reassembling. This step will help ensure proper fit, at the same time protecting the pump non-metal parts (elastomers) from cutting and scoring.

To Check Valves

- 1) Loosen and remove screws (54 with a 10mm allen wrench.
- 2) Remove discharge casing (48) and valve tension springs (53).
- 3) Remove the discharge valves (51) by screwing supplied valve-puller into the top of the spacer pipe (51E) and firmly sliding upward with the puller handle. **NOTE:** The pressure valve adapter (52) will typically come out attached to the discharge valve. To remove, firmly grasp both pieces and rock them back and forth to break the O-ring seal on the O.D. of the valve seat.
- 4) Remove the inlet valves using the same procedure as above.
- 5) Unscrew the valve seat (51A) from the spacer pipe (51E). Remove the valve spring (51D) and valve spring guide (51F) and inspect for wear. Replace parts as necessary
- 6) Check surfaces of valve plate (51C), valve seat (51A), O-rings (51B) and replace worn parts.
- 7) To reinstall the inlet valves (51), screw the valve puller back into the top of the valve assembly (51). Lower the valve into the chamber and press firmly into the bottom of the chamber to ensure the valve is seated properly. Install the tension spring (53).
- 8) To reinstall the discharge valves, press the discharge valve (51) into the pressure valve adapter (52). Push the entire assembly into the chamber. Reinstall the tension spring (53).
- 9) Reinstall the discharge casing (48) and tighten bolts (54) to 155 ft-lbs. in a criss-cross pattern starting with the centermost 4 bolts and working outward.

To Change Seals

- 10) Loosen nuts (49A) with a 24mm socket wrench.
- 11) With a rubber mallet tap the back of the valve casing (50) and pull the valve casing off the stud bolt (49).
- 12) Remove cover plate (30) with a 10mm socket wrench.
- 13) By gripping hex flats, separate plunger assembly (36) from crosshead (25) by means of two open-end wrenches (size 22mm and 27mm).

CAUTION: Do not loosen the 3 plunger bases (36A) before the valve casing has been removed otherwise the plunger assembly (36) could hit against the spacer pipe (52) when the pump is being turned.

- 14) Remove the intermediate casing (37) from the crankcase (1).
- 15) Use two screwdrivers to pry the seal case (47) out of the intermediate casing (37). Remove pressure ring (43), V sleeves (44), sleeve support ring (45), seal tension spring (46), and O rings (47A). Inspect parts for wear and replace as necessary.
- 16) Remove the seal sleeve (38), O ring (39), pressure ring (40), V sleeve (44), O ring (42) and drip return ring (41) from the crankcase (1). Inspect parts for wear and replace as necessary.
- 17) Inspect the plunger pipe for cavitation, cracks, or any other signs of wear. If replacing plunger pipe, tighten plunger bolt (36C) to 26 ft-lbs.
- 18) Reassemble all parts in reverse order taking care to lubricate all seals and O rings with silicone grease prior to installation. Reinstall plunger pipe assemblies (36) into intermediate casing (37). When installing the intermediate casing (37) and valve casing (50) be sure that the parts rest on the studs (50A) and that they have not fallen out.
- 19) Reinstall valve casing (50) and tighten nuts (49A) to 103 ft-lbs.

To Change Oil Seals

- 20) Remove C-clip (33B) from crankcase (1) and remove seal retainer (33).
- 21) Remove O ring (33A) and radial shaft seal (32) and replace as necessary.
- 22) Reinstall seal retainer (33) and secure with C-clip (33B) in crankcase.

NOTE: Seal life can be increased if the pretensioning allows for a little leakage. This assists lubrication and keeps the seals cool. It is therefore not necessary to replace seals before the leakage becomes too heavy and causes output and operating pressure to drop.

To Disassemble Gear End

- 23) Remove entire manifold and intermediate casing assembly using procedures described above. Take out plunger assembly (36). Drain oil.

GP7170-4000 REPAIR INSTRUCTIONS

- 24) After removing the C-clip (33B), pry out seal adapter (33) with a screwdriver.
- 25) Check seals (32) and surfaces of plunger base (25).
- 26) Remove crankcase cover (4). Loosen inner hexagon screws (24A) on the connecting rods (24) and push con rod halves as far into the crosshead guide as possible.

CAUTION: Connecting rods (24) are marked for identification. Do not twist connecting rod halves. Connecting rod is to be reinstalled in the same position on crankshaft journals.

- 27) Check surfaces of the connecting rod (24) and crankshaft (22).
- 28) Take out bearing cover (14) to one side and push out crankshaft (22) taking particular care that the connecting rod (24) doesn't bend.
- 29) Reassemble in reverse order: Regulate axial bearing clearance - minimum 0.1mm, maximum 0.15mm-by means of fitting disc (20A). The crankshaft (22) should turn easily with little clearance. Tighten inner hexagon screws (24A) to 30 ft.-lbs.

CAUTION: Connecting rod (24) has to be able to be slightly moved sidewise at the stroke journals.

- 30) Reassemble cover (4) and seal (5) onto crankcase (1). Fasten with hexagon screws (10).
- 31) Reinstall shim (33C), and seal adapter (33) with radial shaft seal (32), and o-ring (33A) onto crankcase (1).

CAUTION: Radial shaft seal (32) must always be installed so that the seal-lip on the inside diameter faces the oil.

- 32) Reinstall remainder of fluid end as described above.

GP7170-4000 TORQUE SPECIFICATIONS

Position	Item #	Description	Torque Amount (ft.-lbs.)
36C	07664	Plunger Tensioning Screw	26
49A*	13160	Nut	103
54	05250	Inner Hexagon Screw	155

*Important - Check torque bi-weekly on item 49A

Preventative Maintenance Check-List & Recommended Spare Parts List						
Check	Daily	Weekly	50hrs	Every 500 hrs	Every 1500 hrs	Every 3000 hrs
Oil Level/Quality	X					
Oil Leaks	X					
Water Leaks	X					
Belts, Pulley		X				
Plumbing		X				
Recommended Spare Parts						
Oil Change			X	X		
Plunger Spare Parts (1 kit/pump) (See page 5 for kit list)					X	
Oil Seal Kit (1 kit/pump) (See page 5 for kit list)					X	
Valve Spare Parts (1 kit/pump) (See page 5 for kit list)						X

GIANT INDUSTRIES LIMITED WARRANTY

Giant Industries, Inc. pumps and accessories are warranted by the manufacturer to be free from defects in workmanship and material as follows:

1. For portable pressure washers and car wash applications, the discharge manifolds will never fail, period. If they ever fail, we will replace them free of charge. Our other pump parts, used in portable pressure washers and in car wash applications, are warranted for five years from the date of shipment for all pumps used in NON-SALINE, clean water applications.
2. One (1) year from the date of shipment for all other Giant industrial and consumer pumps.
3. Six (6) months from the date of shipment for all rebuilt pumps.
4. Ninety (90) days from the date of shipment for all Giant accessories.

This warranty is limited to repair or replacement of pumps and accessories of which the manufacturer's evaluation shows were defective at the time of shipment by the manufacturer. The following items are NOT covered or will void the warranty:

1. Defects caused by negligence or fault of the buyer or third party.
2. Normal wear and tear to standard wear parts.
3. Use of repair parts other than those manufactured or authorized by Giant.
4. Improper use of the product as a component part.
5. Changes or modifications made by the customer or third party.
6. The operation of pumps and or accessories exceeding the specifications set forth in the Operations Manuals provided by Giant Industries, Inc.

Liability under this warranty is on all non-wear parts and limited to the replacement or repair of those products returned freight prepaid to Giant Industries which are deemed to be defective due to workmanship or failure of material. A Returned Goods Authorization (R.G.A.) number and completed warranty evaluation form is required prior to the return to Giant Industries of all products under warranty consideration. Call (419)-531-4600 or fax (419)-531-6836 to obtain an R.G.A. number.

Repair or replacement of defective products as provided is the sole and exclusive remedy provided hereunder and the MANUFACTURER SHALL NOT BE LIABLE FOR FURTHER LOSS, DAMAGES, OR EXPENSES, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGES DIRECTLY OR INDIRECTLY ARISING FROM THE SALE OR USE OF THIS PRODUCT.

THE LIMITED WARRANTY SET FORTH HEREIN IS IN LIEU OF ALL OTHER WARRANTIES OR REPRESENTATION, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL SUCH WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY THE MANUFACTURER.



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